TROPICAL MARINE FISHES IN THE GULF OF MEXICO

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Recently the Los Angeles County Museum received a small collection of marine fishes obtained near Fort Walton Beach, Florida, by Winfield Brady, then of Florida's Gulfarium. Among them were specimens that represent two new records of tropical forms from the northeastern Gulf of Mexico and others that clarify the distribution of a third such species. These specimens, and others of a similar tropical origin reported upon in a number of recent papers, prompt remarks of a general zoogeographical nature concerning the distribution of tropical marine forms on the continental shelf throughout the Gulf of Mexico.

Annotated List of Specimens

Gymnothorax vicinus (Castelnau).

According to distributional data given by Briggs (1958, p. 262), a single specimen of this moray, approximately 550 mm in total length (LACM 2450), extends the range of this species some 585 shoreline miles into the northeastern Gulf of Mexico from the present northernmost recorded locality at Tortugas, Florida.

Pomacanthus arcuatus (Linnaeus).

Springer and Woodburn (1960, p. 69) reported a specimen of this angelfish from off Tampa Bay, Florida. Two specimens (LACM 2451) from off Fort Walton Beach, 70 and 107 mm standard length, extend the range of this species some 360 shoreline miles to the north and west into the northeastern Gulf of Mexico.

Eupomacentrus variabilis Castelnau.

Caldwell and Briggs (1957, p. 4) reported this damselfish from the northeastern Gulf questionably as *Pomacentrus xanthurus* Poey. Later, Loren P. Woods identified a sample of these specimens as *E. variabilis,* and I corrected the name used in the first report (Caldwell, 1959, p. 72).

Rivas (1960, p. 150) placed *P. xanthurus* in the synonymy of *variabilis.* Without seeing the specimens reported by Caldwell and

Briggs, he suspected that they were *P. fuscus* (Cuvier), or a mixture of that and some other species; but he probably did not see my later paper in time to comment on it.

To settle the status of *E. variabilis* in the fauna of the northeastern Gulf of Mexico, it is desirable to report that the Fort Walton collection contained eight specimens of this species (40 to 100 mm standard length, LACM 2452) which were determined with the aid of Rivas (*op. cit.*). Furthermore, these new specimens appear to be identical with others from the Morant Cays, off Jamaica, which Woods identified as *E. variabilis* at the same time he examined the original Florida material.

Zoogeographical Remarks

As previously noted elsewhere (Briggs, 1958; Caldwell, 1959), the distribution of tropical marine fishes in the eastern Gulf of Mexico probably extends along the entire western edge of peninsular Florida in the deeper waters of the continental shelf. The presence of a tropical fish fauna on the shelf in the north central Gulf was suggested by Dawson (1962, 1963), and one in the northwestern Gulf by Hoese (1958) and Springer and Hoese (1958). A similar tropical fauna can be expected in all Mexican Gulf waters. Such a distribution of tropical fishes can be explained on the basis of currents and bottom types. Within the Gulf of Mexico the distribution of the tropical fishes appears to be discontinuous, and probably is similar to that recently described (Caldwell, 1962) for the short bigeye, *Pseudopriacanthus altus* (Gill). The distribution of that species is related to current patterns, in the case of the pelagic larvae, and to bottom type, in the case of the transformed life stages.

It is likely that the continued presence of tropical fishes in the more northern areas of the Gulf of Mexico can be attributed to recruitment through transport of pelagic eggs and larvae by the currents that flow up from the south (Leipper, 1954, pp. 121 and 122), and to spawning by a resident population of adults on the deeper reefs in years of favorable conditions of temperature. The presence of such a population of adults has been confirmed by observations made by SCUBA divers trained in ichthyology (Winfield Brady and J. B. Siebenaler, personal conversations).

The occurrence of tropical fishes in the Gulf may be limited primarily to coral and sponge patches which lie along the coast of Florida and spottily elsewhere in the Gulf on the continental shelf (see Lynch, 1954, p. 79; Hedgpeth, 1954, p. 206). Evidence that a tropical fish fauna occurs on the offshore reefs off Tampa Bay, midway between the tropical Florida Keys and the northeastern Gulf, was presented by Springer and Woodburn (1960). Ichthyological faunal studies (several cited by Caldwell, 1959) between Tampa Bay and the northeastern Gulf of Mexico west of Cape San Blas have been made almost exclusively in shallow inshore waters on mud and sand bottoms. When collecting efforts in this region are extended further offshore into the deeper coral and sponge areas, it is almost certain that tropical fishes will be found along the entire coast.

Continued collecting efforts, especially on the reefs and sponge bottoms that occur spottily throughout the Gulf of Mexico on the continental shelf, will almost surely demonstrate that tropical fishes are more widespread in the Gulf than present zoogeographical summaries indicate. Similar distributions can be expected for invertebrates of tropical origin (Ingle, *et al.*, 1963).

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